UNITED STATES PATENT AND TRADEMARK OFFICE

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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Ex parte ELIZABETH S. BARON, DANIEL H. ORR, and
MICHAEL S. VOLK

_____

Appeal 2016-007336
Application 13/436,099[1]
Technology Center 2100

_____

Before THU A. DANG, JOHN A. EVANS, and CARL L. SILVERMAN,
Administrative Patent Judges.

SILVERMAN, *Administrative Patent Judge.*

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's
Final Rejection of claims 1–11 and 13–21, which constitute the only pending
claims. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

STATEMENT OF THE CASE

The invention relates to sharing a virtual reality environment.
Abstract; Spec. ¶ 1. Claim 1 is exemplary of the matter on appeal (disputed
limitations emphasized):

_____

[1] According to Appellants, the real party in interest is Ford Motor Company.
App. Br. 2.

1.   A system, comprising:

a first virtual reality device that includes a processor and a memory, the memory storing a first set of instructions executable by the processor for:

generating a virtual reality environment that includes a single coordinate system;

then, before providing any data relating to a specific optical viewpoint in the virtual reality environment, providing the virtual reality environment, including the single coordinate system, to a second virtual reality device;

then, after establishing the single coordinate system and providing the single coordinate system to the second virtual reality device, providing a first stream of tracking data from the first virtual reality device specifying coordinates for a first optical viewpoint in the virtual reality environment according to the single coordinate system to each of a first display device that is geographically proximate to the first virtual reality device and to the second virtual reality device that is geographically remote from the first virtual reality device; and

then updating and further providing the first stream of tracking data, thereby providing an updated position of the first optical viewpoint, to the second virtual reality device according to updated coordinates according to the single coordinate system.

App. Br. 14 (Claims App.).

<div align="center">THE REJECTION</div>

Claims 1–11 and 13–21 stand rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over Bertolami et al. (US 2010/0287485 Al; pub. Nov. 11, 2010) ("Bertolami") in view of Molyneux (US 8,120,655 Bl; iss. Feb. 21, 2012) ("Molyneux"). Final Act. 4–16.

ANALYSIS

Appellants argue the Examiner errs in finding Bertolami and Molyneux teach the claim 1 limitations:

> generating a virtual reality environment that includes a single coordinate system [and]
> then, before providing any data relating to a specific optical viewpoint in the virtual reality environment, providing the virtual reality environment, including the single coordinate system, to a second virtual reality device, providing a first stream of tracking data from the first virtual reality device specifying coordinates for a first optical viewpoint in the virtual reality environment according to the single coordinate system to . . .

App. Br. 7–9.

Appellants argue "all of Bertolami's disclosed embodiments in fact require exchanging images or some other location information before Bertolami's 'common coordinate system' can be established." App. Br. 7. According to Appellants, Bertolami teaches the reverse of claim 1 because Bertolami teaches sharing image date according to different coordinate systems to negotiate a single (unified) coordinate system and, at that time, Bertolami can then share data relating to a specific optical viewpoint. *Id.* at 8. Appellants argue Bertolami requires virtual images to be shared before a unified coordinate system may be determined. *Id.* (citing Bertolami ¶ 55, 58, 70).

The Examiner finds Bertolami teaches a virtual reality system in which two or more users can create a virtual reality environment with a common or single coordinate system and describes an operation that occurs in a specific order. Ans. 4–5 (citing Bertolami Fig. 5; ¶ 66). The Examiner finds Bertolami describes "determining a proposed coordinate system with

the use of image data from one or more of the devices" and "[t]hen, after

generating a proposed coordinate system, the system will transmit the

proposed coordinate system data to another user for a response." *Id.* at 5.

The Examiner finds Bertolami also describes "a user device may be the

device designated ... to determine an origin and orientation for a unified

coordinate system" and "[t]hen, 'once the designated user device determines

the origin and orientation, it may transmit this data to other user devices ...

and the other devices may begin to use the coordinate system determined by

the designated user device.'" *Id.* at 5 (citing Bertolami ¶73). The Examiner

then finds:

> In either situation, Bertolami teaches collecting information from image data to determine a coordinate system or just allowing a single user to determine a coordinate system *before* transmitting the coordinate system information to the other users. After the coordinate information is transmitted, *then* images are presented to each user based on the determine[d] coordinate system. The order of operation as currently recited in the current claim set is the same as Bertolami describes them, i.e. generating a coordinate system *then* transmitting just the coordinate system *then* transmit image data to be displayed. As Bertolami describes this order of operation in **Paras. 66-76 and 80** in conjunction with **Fig. 5,** Bertolami teaches the order of operation as described in the independent claims.

Ans. 5.

We are not persuaded by Appellants' arguments and agree, instead,

with the Examiner's findings. While, in some situations, Bertolami may use

images to determine a coordinate system, these images are not images to be

displayed and are not *data related* to a *specific optical viewpoint.*

Appellants argue Molyneux does not cure the deficiencies of

Bertolami and does not disclose providing "data from the first virtual reality

device specifying coordinates for an optical viewpoint in the virtual reality

environment according to the single coordinate system to each of a first

display device" and to a "second virtual reality device." App. Br. 9 (citing

Final Act. 5). Appellants argue:

> Bertolami thus accomplishes providing different viewing different perspectives on different devices viewing a same virtual environment, but unlike the invention of claim 1, does not accomplish providing a same viewing perspective, or optical viewpoint, for different users on different devices.
>
> Molyneux discloses a system in which audience members at a theatrical performance are provided with virtual reality devices such as virtual reality goggles "to permit a customizable theatrical experience for that individual audience member and thereby combine the features of a live theatrical experience with those of virtual reality games, etc." (Molyneux, column 1, lines 61-66.)
>
> According to the Final Office Action (page 5), Molyneux discloses "specifying coordinates for an optical viewpoint in the virtual reality environment according to the single coordinate system" by describing "feeding the signals from the respective cameras mounted on the performers through a processor that directs the signal to individual audience members in response to selections made by the audience member." (Molyneux, column 2, lines 26-29.) However, merely providing a camera image in reality does not even come close to meeting the foregoing recitation of claim 1.
>
> In disclosing at most exchanging camera images, Molyneux provides no teaching or suggestion that his camera images would have included any data "specifying coordinates for an optical viewpoint in the virtual reality environment." Indeed, Molyneux is notably silent with respect to establishing a virtual reality environment, and notably does not even mention a coordinate system for a virtual reality environment, much less sharing any information according to such coordinates. Providing a camera image to a display device upon a user selection of the image would not have required, and in no way suggests, any specification of coordinates, much less "specifying coordinates for an optical viewpoint" as recited in claim 1. Indeed, providing a camera image is

entirely different than "specifying coordinates," much less "specifying coordinates for an optical viewpoint in the virtual reality environment according to the single coordinate system."

App. Br. 10–11.

The Examiner finds Bertolami teaches:

Bertolami teaches transmitting and providing tracking or image data according to the single coordinate system with reference to **Fig. 5, step 575, Para. 80,** where a resynchronization process is determined to again collect image data from each user within the single coordinate system **[Fig. 5, steps 520-530]** to be transmitted to all other devices within the single coordinate system **[Fig. 5, step 550, skipping steps 540 and 560-565 since the single coordinate system has already been determined]** to then update and display the image data based on the single coordinate system to each user within the single coordinate system **[Fig. 5, step 570].**

Although Bertolami describes image data as being "cartography information about the physical environment or information on the specific mapping data that matched elements in one or more scene images" **[Para. 74],** Bertolami still describes transmitting data to other users based on the single coordinate system. Since Bertolami did not explicitly discuss viewpoint tracking data, the examiner including Molyneux, which teaches relaying information from one person to another in the form of viewpoint data. Molyneux describes a system in which "each audience member is provided with one or more 'virtual reality' devices" **[Col. 1, lines 62-63]** to "view the performance from a different actor's perspective" **[Col. 2, lines 20-21]** by "feeding signals from the respective cameras mounted on the performers through a processor that directs the signal to individual audience members in response to selections made by the audience member" **[Col. 2, lines 26-29].** This means that Molyneux gathers "performance inputs which can be data from cameras worn by individual performers" **[Col. 4, lines 63-65]** to be displayed or presented to individual audience members **[Col. 4, lines 63-67, Col. 5, lines 1-11].**

Since Bertolami describes transmitting image data to and from users to be used within the single coordinate system and is only missing

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viewpoint tracking data, it would have been obvious to one of ordinary
skill in the art to add Molyneux, which describes transmitting viewpoint
tracking data, as an additional feature within Bertolami. Thus,
Bertolami in view of Molyneux teaches all of the elements recited in
the independent claims.

Ans. 6–7.

We are not persuaded by Appellants' arguments that Molyneux does
not cure the deficiencies of Bertolami and agree, instead, with the
Examiner's findings. As discussed, *supra*, Bertolami teaches and suggests
the claim 1 limitations except optical viewpoint tracking, which is taught by
Molyneux. Appellants argue the references individually whereas the
rejection is based on the combination of the references. *In re Keller*, 642
F.2d 413, 426 (CCPA 1981)("[O]ne cannot show non-obviousness by
attacking references individually where, as here, the rejections are based on
combinations of references" (citations omitted)); *In re Merck & Co., Inc.*,
800 F.2d 1091, 1097 (Fed. Cir. 1986).

The test for obviousness is not whether the features of a secondary
reference may be bodily incorporated into the structure of the primary
reference; nor is it that the claimed invention must be expressly suggested in
any one or all of the references. Rather, the test is what the combined
teachings of the references would have suggested to those of ordinary skill
in the art. *See Keller*, 642 F.2d at 425.

As stated by the Supreme Court, the Examiner's obviousness rejection
must be based on:

> [S]ome articulated reasoning with some rational underpinning to
> support the legal conclusion of obviousness . . . . [H]owever, the
> analysis need not seek out precise teachings directed to the
> specific subject matter of the challenged claim, for a court can

take account of the inferences and creative steps that a person of ordinary skill in the art would employ.

KSR Int'l. Co. v. Teleflex, Inc., 550 U.S. 398, 418 (2007) (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

The Examiner's findings are reasonable because the skilled artisan would "be able to fit the teachings of multiple patents together like pieces of a puzzle" since the skilled artisan is "a person of ordinary creativity, not an automaton." *KSR*, 550 U.S. at 420–21.

Appellants further argue the references could not and would not have been combined. App. Br. 11. According to Appellants:

> Thus, the Office did not explain how Molyneux compensated for Bertolami's failure to disclose "specifying coordinates for an optical viewpoint," because the Office did not (and could not) allege that Molyneux disclosed "coordinates," much less explain why it would have been obvious to import any such teaching from Molyneux into Bertolami. Accordingly, the rejection should be reversed at least because the Office did not, and could not, provide any reason why the references could have met all of the recitations of claim 1, even if they could have been combined.
>
> Bertolami teaches a virtual reality system using virtual images. Molyneux teaches a system using virtual reality display devices to display actual images. The actual camera images of Molyneux would have had no place in the system of Bertolami. There is no reason why it would have occurred to one of ordinary skill to use Molyneux's camera images in the system of Bertolami. Bolstering the fact that one of ordinary skill would not have thought to use the camera images of Molyneux in the context of Bertolami is that the camera images of Molyneux would not have been usable in the context of Bertolami's system, directed solely to a virtual gaming environment. Moreover, the fact that the references could not have been combined also weighs dispositively against a finding that there would have been reason

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to import teachings from Molyneux into Bertolami. One of ordinary skill would have seen no reason to combine such disparate references.

App. Br. 11.

The Examiner finds:

Bertolami teaches a virtual reality system in which two or more users can create a virtual reality environment with a common or single coordinate system to then gather and transmit tracking or image data to one another to be used within the single coordinate system. Bertolami describes using physical areas **[Fig. 2, Para. 25]** or a predetermined set of origins based upon location information **[Para. 72].** This means that Bertolami can use actual physical locations for determining a single coordinate system.

Likewise, Molyneux uses actual physical locations and images to be used with the virtual reality devices. As described above, Molyneux teaches an interactive theatrical performance by relaying information from one person to another in the form of viewpoint data. Molyneux describes a system where "each audience member is provided with one or more 'virtual reality' devices" to "view the performance from a different actor's perspective" by "feeding signals from the respective cameras mounted on the performers through a processor that directs the signal to individual audience members in response to selections made by the audience member." Molyneux uses real physical location and image data to be transmitted to each member within the system.

Molyneux *would* have a place within Bertolami because both systems use actual physical locations to produce a virtual reality environment. Also, the combination of Bertolami and Molyneux is applicable because Bertolami teaches all of the limitations as currently recited except for viewpoint tracking data. But, Bertolami still transmits image data to resynchronize the displays of each user and adding Molyneux would complete the types of data to be transmitted, i.e. viewpoint tracking data, to be used within the virtual reality environment. Thus, Bertolami and Molyneux would be combinable to teach all of the elements recited in the independent claims.

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Ans. 7–8.

In the Reply Brief, Appellants argue Molyneux, at most discloses exchanging camera images, but "provides no teaching or suggestion that his camera images would have included any data" "specifying coordinates for an optical viewpoint in the virtual reality environment." Reply Br. 2. According to Appellants:

> Molyneux could not even suggest a stream of data "specifying coordinates," because Molyneux does not disclose, and would have had no need of, "coordinates" or any "coordinate system" as recited in claim 1. In other words, even if Bertolami and Molyneux were combined, the result would have been at most a stream of image data - without "tracking data ... specifying coordinates" – provided to the system of Bertolami from the cameras of Molyneux. Such a feature added to Bertolami would have been useless, and, moreover, would not have met the recitation in claim 1 of "a first stream of tracking data from the first virtual reality device specifying coordinates for a first optical viewpoint in the virtual reality environment according to the single coordinate system."

Id.

We are not persuaded by Appellants' arguments that Bertolami and Molyneux could not/would not be combined and agree, instead, with the Examiner's findings. We agree with the Examiner that the combination of Bertolami and Molyneux teaches and suggests the claim 1 limitations, as discussed *supra*. Bertolami and Molyneux teach real physical location and image data to be transmitted wherein Bertolami teaches establishing coordinates and Molyneux teaches optical viewpoint tracking data. *See also* our discussion, *supra*, regarding Appellants' argument that Molyneux does not cure the deficiencies of Bertolami.

On this record, Appellants do not present sufficient evidence that the combination of the cited references was "uniquely challenging or difficult

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for one of ordinary skill in the art" or "represented an unobvious step over the prior art." *Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007) (citing *KSR*, 550 U.S. at 418–19). Nor have Appellants provided objective evidence of secondary considerations, which our reviewing court guides "operates as a beneficial check on hindsight." *Cheese Sys., Inc. v. Tetra Pak Cheese and Powder Sys., Inc.*, 725 F.3d 1341, 1352 (Fed. Cir. 2013).

In view of the above, we sustain the rejection of claim 1, and independent claims 8 and 14 because claim 1 is identified as representative of independent claims 8 and 14 (*see* App. Br. 7). We also sustain the rejection of dependent claims 2–7, 9–11, 13, and 15–21 as these claims are not argued separately. *See* 37 C.F.R. § 41.37(c)(1)(iv).

DECISION

We affirm the Examiner's decision rejecting claims 1–11 and 13–21.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv).

<u>AFFIRMED</u>